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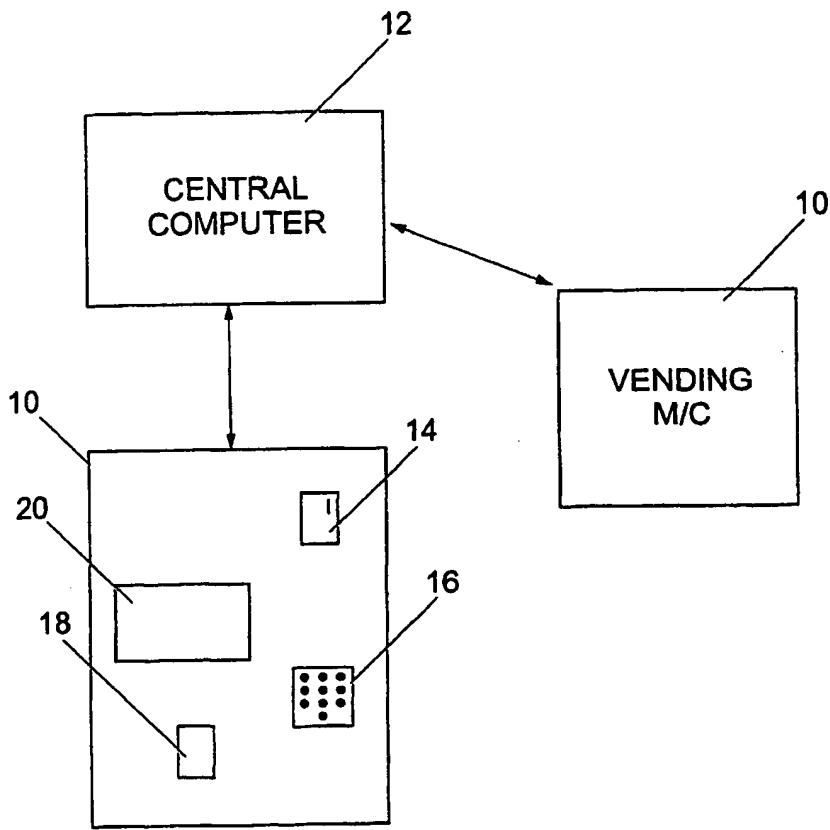
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0009271.8 15 April 2000 (15.04.2000) GB(71) Applicant (*for all designated States except US*): **VIANET LIMITED [GB/GB]**; 5 Belleknowes Industrial Estate, Inverkeithing, Fife KY11 1HY (GB).

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(54) Title: INTERACTIVE DISPENSING APPARATUS



(57) Abstract: A vending machine (10) in addition to the normal coin acceptor (14) and selection keypad (16) has a display screen (20) which is used in conjunction with the keypad (16) to interact with the user. The vending machine (10) and similar vending machines form part of a system communicating with a central computer (12) which monitors stock levels and machine functions, and also derives information, such as marketing information and customer preferences, from the user interaction and may modify displayed material accordingly.

**WO 01/43088 A1**



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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

1    "Interactive Dispensing Apparatus"

2

3    This invention relates to apparatus for dispensing or  
4    vending goods, such as drinking water dispensers,  
5    vending machines for hot or cold drinks or snacks,  
6    photobooths, photocopiers, and other such apparatus.

7

8    Hitherto, dispensing apparatus of this type have  
9    displayed only minimal information of a purely  
10   functional nature to the users, and the only  
11   information supplied by the user has been to indicate  
12   the type and/or quantity of goods desired.

13

14   The present invention is based upon the realisation  
15   that the presence and use of dispensing apparatus  
16   provides an opportunity for interaction with a wide  
17   range of consumers.

18

19   Also, many forms of dispensing apparatus have in the  
20   past suffered from poor vendor service with stock

1 commonly running out. Preferred forms of the present  
2 invention also address this difficulty.

3

4 Accordingly, the present invention in one aspect  
5 provides a dispensing apparatus comprising means for  
6 dispensing at least one product when requested by a  
7 user; an interactive user interface comprising means  
8 for imparting information to the user, and user-  
9 operated data input means adapted to permit the user  
10 to input both product-dispensing commands and data  
11 not necessarily related to product dispensing; memory  
12 means for storing data related to use of the  
13 apparatus; and communication means arranged to  
14 transmit said data between the apparatus and a remote  
15 management location.

16

17 The data may be data relating to users of the  
18 machine, or to the operational status of the machine,  
19 or both.

20

21 The means for imparting information to the user may  
22 suitably comprise a display screen, and the user-  
23 operated data input means may be in the form of a  
24 keyboard or touch sensitive areas on said screen.

25 The display screen may be a simple one line LED  
26 screen, through to a full colour, full motion screen  
27 which may be used to display advertising or  
28 informational material.

29

1 The communication means may comprise means for  
2 periodic connection via a public telephone network, a  
3 GSM service, the Internet, or some other available  
4 communications network to a central control location.

5

6 Preferably, the communication means is arranged to  
7 receive data defining material to be displayed, such  
8 as advertisements.

9

10 The invention is capable of controlling functions of  
11 equipment to which it is fitted (the host equipment)  
12 and by assessing the status of sensors and other  
13 devices to which it is connected within the host  
14 equipment it is able to perform logical functions  
15 that result in an output action, for example;

16

17 Thermostatic control of the temperature of  
18 products that are contained within the host equipment  
19 Control of dispensing valves, doors, switches,  
20 chutes, motors, lamps etc

21

22 The display can be used to permit engineering and/or  
23 servicing diagnostic testing to be performed to  
24 assess the operational status of the equipment during  
25 maintenance/configuration/repairs etc and also to the  
26 user during normal operation.

27

28 Data can be made available to the invention from  
29 sources appropriate to the volumes/speed/bandwidth  
30 requirements of suitable data storage devices

1 connected to the invention for example, flash memory,  
2 CD ROM, DVD, Video Tape.

3

4 Data for display can also be sent to the invention  
5 over the communications network.

6

7 The invention when fitted with an optional studio  
8 reproduction/recognition module is able to produce  
9 sounds/music/speech and also to respond to spoken  
10 stimulus which may be associated with  
11 visual/messages/video/display information produced by  
12 the invention.

13

14 From another aspect, the invention provides a method  
15 of managing a plurality of dispensing apparatus at a  
16 variety of locations, the method comprising remotely  
17 monitoring the persons using and/or the products  
18 dispensed at each location, and controlling the  
19 dispensing apparatus and/or causing information to be  
20 displayed at each location in a manner determined or  
21 modified by the information collated by said  
22 monitoring.

23

24 The information displayed may comprise advertising.

25

26 Preferably the information is displayed via an  
27 interactive display to permit a response by the user.  
28 This may be used to generate consumer follow up in  
29 response to the advertising, or data related to

1 advertising effectiveness, to provide the opportunity  
2 to win prizes, or for amusements.

3

4 The information displayed may be modified according  
5 to the product requested by a particular user, or  
6 according to the product mix requested at that  
7 location, or the data and time of day.

8

9 An embodiment of the invention will now be described,  
10 by way of example, with reference to the drawings, in  
11 which:

12

13 Fig. 1 is a block diagram illustrating a system  
14 embodying one form of the invention;

15

16 Fig. 2 is a block diagram showing a preferred  
17 form of information handling within a vending  
18 machine of Fig. 1;

19

20 Fig. 3 illustrates one-line text displays;

21

22 Fig. 4 illustrates multi-line displays; and

23

24 Fig. 5 illustrates a number of possible  
25 embodiments of the invention in the form of a  
26 water cooler.

27

28 Referring to Figure 1, a number of vending machines  
29 10, only two of which are shown, are in periodic  
30 communication with a central computer 12. As

1 indicated in Fig. 1, each vending machine 10 is of a  
2 conventional arrangement insofar as it comprises a  
3 payment acceptor 14, a keyboard 16, and a product  
4 dispense location 18. The actual vending operation  
5 is entirely conventional and will not be described  
6 herein. The vending machine additionally comprises a  
7 display screen indicated at 20. The display screen  
8 20 could be a single-line LED screen displaying  
9 stationary or scrolling messages. Alternatively, it  
10 could be a larger screen showing text, or a fully  
11 functional moving video display.

12

13 Each vending machine also contains additional  
14 electronics as illustrated in Figure 2.

15

16 A communication device 21 handles communication with  
17 the central computer 12. The communication device 21  
18 may be a device for working over the public telephone  
19 network, a GSM network, or the Internet, or any other  
20 available network. The communication device 21 is  
21 interfaced with the remainder of the electronics via  
22 a communications interface 22. Suitable forms of  
23 communication device 21 and communications interface  
24 22 are well known in the art.

25

26 The electronics are co-ordinated and controlled by a  
27 processing and control circuit 23, which may suitably  
28 be a programmable logic controller. The controller  
29 23 drives the display 20 via a display interface 24.  
30 A memory 25 is provided, which will typically store

1 both data collected from the dispenser and display  
2 information for use in driving the display 20. The  
3 form of memory used will be dependent on the nature  
4 of display desired. For simple text messages, a  
5 flash memory or simple ROM may be sufficient, while  
6 for full motion, full colour visuals it may be  
7 appropriate to use a mass storage device such as a  
8 CD-ROM or videotape. The memory 25 will also require  
9 to include read/write memory such as a RAM chip.

10

11 A sensor/data collection interface 26 is provided to  
12 provide the controller 23 with information from the  
13 keyboard 16 and from the dispensing apparatus itself.  
14 For example, the apparatus may monitor sensors such  
15 as temperature sensors and switches used in counting  
16 machine contents. A control interface 27  
17 interconnects the controller 23 with devices within  
18 the dispenser which require to be controlled, such as  
19 motors and switches.

20

21 The various circuits of Figure 2 are powered by a  
22 power supply 28, which may incorporate a back-up  
23 supply to maintain memory and communication functions  
24 during any loss of mains power.

25

26 The electronics of Figure 2 may be arranged in three  
27 modules. A first module contains the controller 23  
28 and the power supply 28. A second module contains  
29 the communication device 21 and the communications

1 interface 22. A third module contains the interfaces  
2 24, 26 and 27 and the memory 25.

3

4 The use of a three module system of this kind is  
5 preferred, since the first module can be common to a  
6 range of applications, while the second module can be  
7 one of a variety depending upon the communication  
8 channel, and the third module can be one of a variety  
9 depending upon the dispensing apparatus to which it  
10 is applied, or the messages to be displayed.

11

12 In use, the central computer 12 either polls or is  
13 polled by the various machines under its supervision  
14 at appropriate intervals of time, or on the  
15 occurrence of predetermined effects. The data  
16 collection interface 26 in each machine is preferably  
17 arranged to collect data regarding the operation of  
18 the machine, such as stock level or any malfunctions,  
19 and this is monitored by the central computer to  
20 arrange servicing and supplies.

21

22 In addition however the display screen 20 is used in  
23 an interactive mode with the user, and the  
24 information for this and an analysis of the results  
25 of it are communicated to and monitored by the  
26 central computer.

27

28 In one fairly simple example, the screen 20 may  
29 display advertising material, with the nature of the  
30 material being altered in accordance with the usage

1 of the machine and the nature of the products in most  
2 demand.

3

4 Alternatively, there may be a more fully interactive  
5 relationship with the user. For example, the screen  
6 could display information in the nature of a quiz  
7 with responses being input via the keyboard 16. A  
8 relationship of this nature could be used for example  
9 to provide prizes by way of free product from the  
10 machine or otherwise, which could be a means for  
11 improving the usage and sales at the machines.

12

13 As discussed above, a variety of displays may be  
14 used.

15

16 Figure 3 illustrates a one-line text display used for  
17 advertising or imparting information. In Figure 1a,  
18 a static or sideways scrolling text is used to  
19 advertise a special offer available on the dispenser.  
20 Figure 1b shows a sideways scrolling display giving  
21 current information, such as Stock Exchange news.

22

23 Figure 4 gives examples of a 3 or 4 line display  
24 operating a user quiz, which could offer prizes such  
25 as a free vend.

26

27 Alternatively, a video display can be used for  
28 example to show a predetermined advertising film  
29 while a given product is being dispensed.

30

1 The arrangement described enables the dispenser to  
2 gather and communicate to the central computer  
3 information which is useful in managing the vending  
4 operation. In particular, the information will  
5 suitably include data on the types of person using  
6 individual machines and their product preferences.  
7 This can be used to optimise the product mix offered  
8 for sale. The information can also have value to  
9 third parties. For example, a manufacturer may wish  
10 to know the age and social profile of purchasers of a  
11 particular product, or the fact that certain products  
12 are commonly bought together, or geographical  
13 variations in product preference.

14

15 The interactivity of the present invention  
16 facilitates the collection of information of this  
17 type, and enables the disclosure of such information  
18 to be encouraged by, for example, the use of quizzes  
19 and prizes.

20

21 Figure 5 shows a number of possible implementations  
22 of the invention in a water cooler as commonly used  
23 in office situations. In each of these, the  
24 interaction may be by means of a one-line LED  
25 display, through to a small touch sensitive screen  
26 which can be readily integrated into a range of  
27 aesthetically attractive designs.

28

1 In addition to interaction with the consumer, the  
2 same data collection and communications electronics  
3 can be used to monitor the following:

4

5 Tap operation - determining water flow, and  
6 dispensing activity, dispenser usage profiling.

7

8 Water heater and chiller operation.

9

10 Temperature of dispensed water, hot, chilled ambient  
11 and mixed (variably chilled).

12

13 Mains electrical supply - Detect presence of mains  
14 electricity - detect disconnection and connection to  
15 mains electricity.

16

17 Following the detection of mains failure a  
18 rechargeable battery power supply will supply  
19 electrical energy to allow continued function of the  
20 invention.

21

22 The insertion and removal of water bottle, water  
23 reservoir, or a disposable water delivery mechanism  
24 of known type.

25

26 Dispenser sanitisation activity

27

28 Control and monitoring additional  
29 facilities/equipment (such as carbonator, oxygenator,  
30 or water quality/identity check module) which are

1 either an integral part of the dispenser or ancillary  
2 external equipment.

3

4 Suitable sensors and control devices for carrying out  
5 these functions will be readily apparent to those in  
6 the art.

7

8 A further preferred feature of the invention resides  
9 in providing the bottles or containers used in the  
10 dispensing apparatus with electronic tags of a type  
11 known per se. Each tag can, for example, identify  
12 the place and date of manufacture or supply. The tag  
13 can then be interrogated by the dispenser and data  
14 communicated to the central computer. As one  
15 example, this can be used to identify and warn of  
16 outdated stock being used. The tag can also be used  
17 to track the products in the supply chain. Instead  
18 of electronic tags, either forms of machine-readable  
19 identification may be used such as bar codes, or even  
20 the use of a specified colour or shape of closure to  
21 identify a given product or supplier.

22

1      CLAIMS

2

3      1. A dispensing apparatus comprising means for  
4      dispensing at least one product when requested  
5      by a user; an interactive user interface  
6      comprising means for imparting information to  
7      the user, and user-operated data input means  
8      adapted to permit the user to input both  
9      product-dispensing commands and data not  
10     necessarily related to product dispensing;  
11     memory means for storing data related to use of  
12     the apparatus; and communication means arranged  
13     to transmit said data between the apparatus and  
14     a remote management location.

15

16     2. Apparatus according to claim 1, in which the  
17     data relates to at least one of: users of the  
18     machine and the operational status of the  
19     machine.

20

21     3. Apparatus according to claim 1 or claim 2, in  
22     which the means for imparting information to the  
23     user comprises a display screen

24

25     4. Apparatus according to claim 3, in which the  
26     display screen is a text character screen formed  
27     by a LED or LCD array.

28

29     5. Apparatus according to claim 3, in which the  
30     display screen is a picture screen.

31

- 1       6. Apparatus according to any preceding claim, in  
2            which the data input means is a keyboard or  
3            keypad.
- 4
- 5       7. Apparatus according to claim 5, in which the  
6            data input means comprises touch-sensitive means  
7            on said picture screen.
- 8
- 9       8. Apparatus according to any preceding claim, in  
10          which the communication means comprises means  
11          for periodic connection to a central control  
12          location via a standard communications network  
13          such as public telephone network, a GSM service,  
14          or the Internet.
- 15
- 16      9. Apparatus according to any preceding claim, in  
17          which the communication means is arranged to  
18          receive data defining material to be displayed.
- 19
- 20      10. Apparatus according to any preceding claim,  
21          wherein the dispenser includes sensors and  
22          control devices enabling the dispenser to  
23          perform logical functions.
- 24
- 25     11. Apparatus according to claim 10, in which said  
26          logical functions comprise one or more of:  
27          thermostatic control of the temperature of  
28          products within the dispenser, and control of  
29          dispensing valves, doors, switches, chutes,  
30          motors, and lamps.

1       12. Apparatus according to claim 10, in which the  
2       dispenser includes means for reading  
3       identification tags affixed to containers  
4       removably positioned within the dispenser.

5

6       13. Apparatus according to any preceding claim, in  
7       which the display the display is additionally  
8       usable to permit engineering and/or servicing  
9       diagnostic testing to be performed to assess the  
10      operational status of the invention during  
11      maintenance, configuration or repairs.

12

13      14. Apparatus according to any preceding claim,  
14      including a data storage device such as flash  
15      memory, CD-ROM, DVD, or videotape.

16

17      15. Apparatus according to any preceding claim,  
18      including a studio reproduction and/or  
19      recognition for producing music or speech,  
20      and/or for responding to spoken stimulus from a  
21      user.

22

23      16. A method of managing a plurality of dispensing  
24      apparatus at a variety of locations, the method  
25      comprising remotely monitoring the persons using  
26      and/or the products dispensed at each location,  
27      and controlling the dispensing apparatus and/or  
28      causing information to be displayed at each  
29      location in a manner determined or modified by  
30      the information collated by said monitoring.

1       17. The method of claim 16, in which the information  
2       displayed comprises advertising.

3

4       18. The method of claim 16 or claim 17, in which the  
5       information is displayed via an interactive  
6       display which permits a response by the user.

7

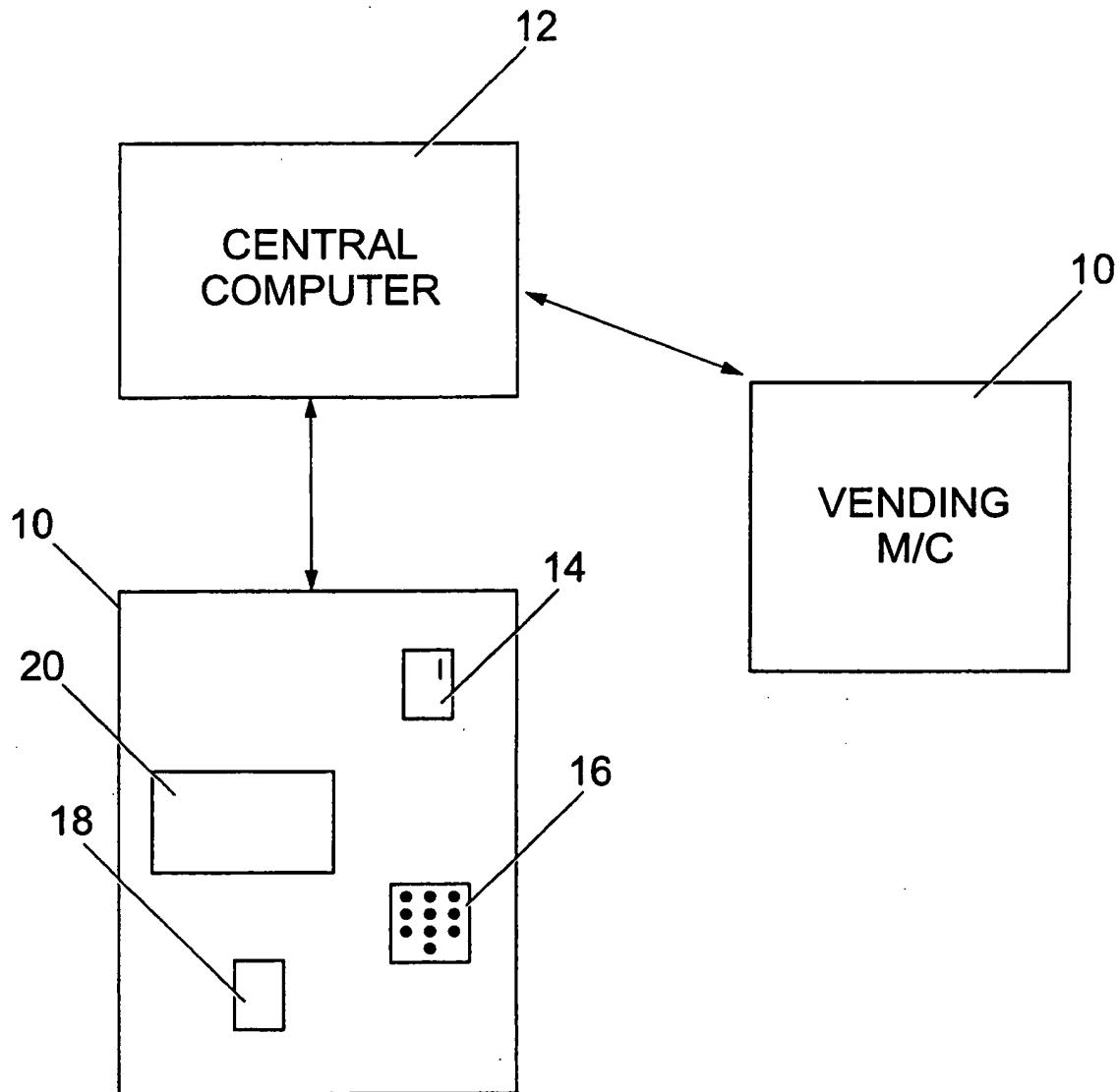
8       19. The method of any of claims 16 to 18, in which  
9       the information displayed is modified according  
10      to the product requested by a particular user,  
11      or according to the product mix requested at  
12      that location, or the data and time of day.

13

14      20. The method of any of claims 16 to 19, which  
15      includes providing materials to be dispensed in  
16      containers labelled with machine-readable  
17      labels, reading the label of each container when  
18      inserted in a dispenser, and communicating data  
19      from the label to the remote monitoring point.



1 / 4



*Fig. 1*

2 / 4

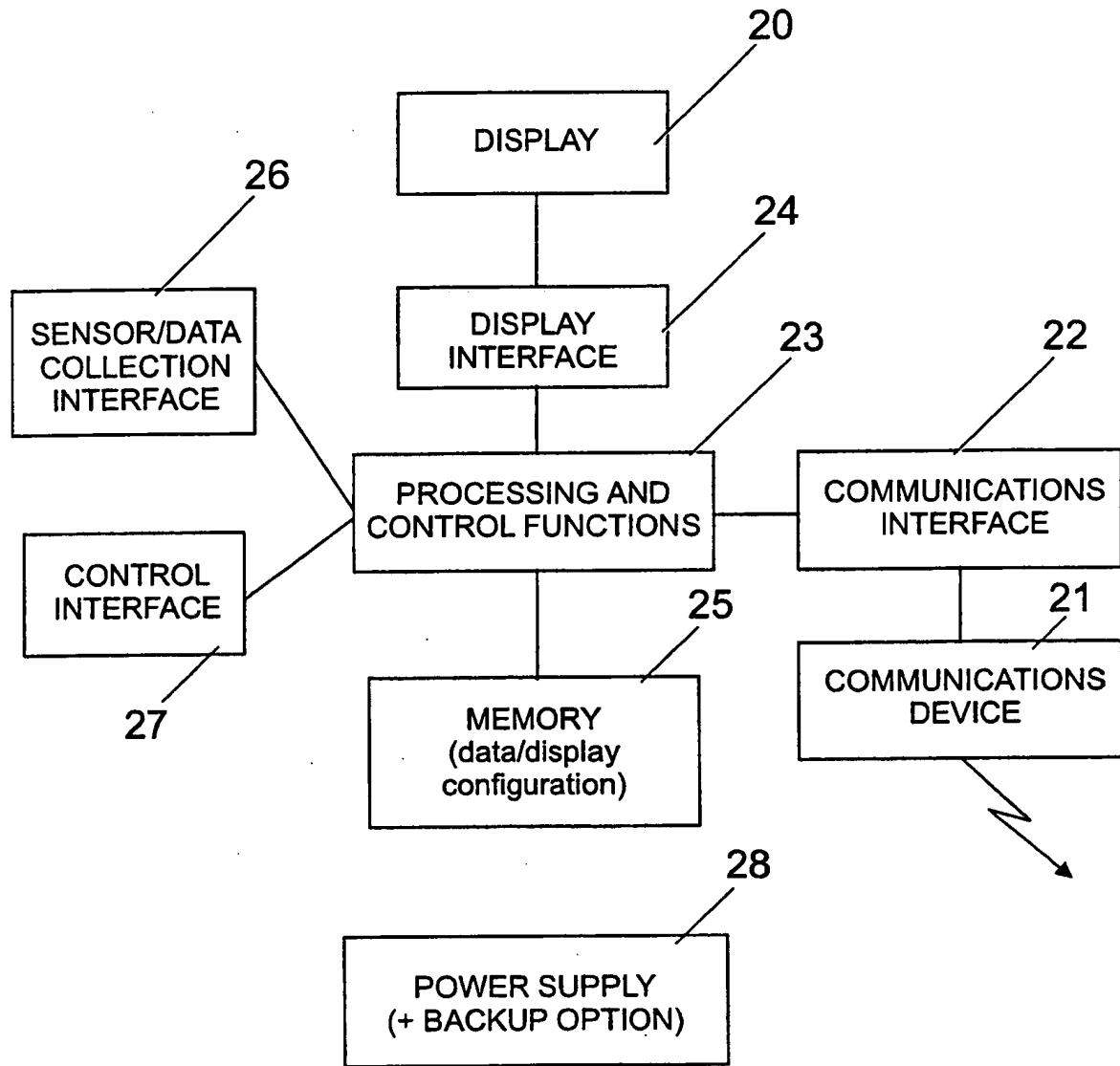


Fig. 2

3 / 4

SPECIAL OFFER-COLA 40p

*Fig. 3a*

FTSE ↓30 6408 \_\_\_ DOW ↓40 10752 \_

*Fig. 3b*

HOW MANY PINTS IN A GALLON

A:4      B:8      C:16

SELECT NOW

*Fig. 4a*

WHAT IS THE DISTANCE  
BETWEEN LONDON AND BEIJING

A: 3845    B: 4685    C: 5055

SELECT NOW

*Fig. 4b*

4 / 4

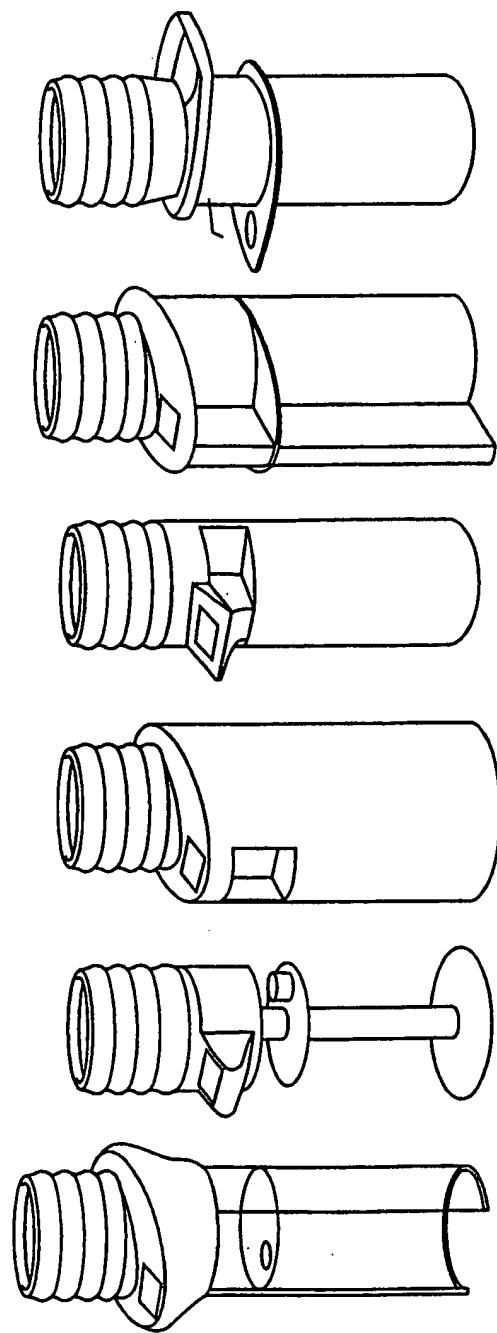


Fig. 5

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/GB 00/04663

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 G07F9/02

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G07F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	abstract; claims; figures column 5, line 1 -column 6, line 50 ---	12,17,20
Y	US 4 803 348 A (D.W. LOHREY) 7 February 1989 (1989-02-07)	1,3,6, 8-11,14, 16,19
A	abstract; claims; figures column 8, line 10 -column 10, line 30 ---	2,4,18
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		-/-

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

° Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
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- \*&\* document member of the same patent family

Date of the actual completion of the international search

29 March 2001

Date of mailing of the international search report

06/04/2001

Name and mailing address of the ISA

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## INTERNATIONAL SEARCH REPORT

Int. Application No

PCT/GB 00/04663

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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Information on patent family members

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